

CHAPTER 15.X.

INFECTION WITH *TAENIA SOLIUM***USA Comments**

During the 83rd General Session, the delegate from the United States intervened to address some items of this new chapter, such as the cut-off of 20 cysticerci and the temperature recommendations for inactivation. In his intervention he mentioned that the United States would be submitting comments addressing these and other items for the Code Commission to consider improving the chapter.

Article 15.X.1.

General provisions

Infection with *Taenia solium* is a zoonotic parasitic infection parasite of pigs and occasionally of other animals. *T. solium* is a cestode (tapeworm) that is endemic in large areas of Latin America, Asia and sub-Saharan Africa. The adult cestode occurs in the small intestine of humans (definitive host) causing taeniosis. The larval stage (cysticercus) occurs in striated muscles, subcutaneous tissues and central nervous system of pigs (intermediate hosts), causing cysticercosis. Other suids and dogs can be infected but are not epidemiologically significant. Humans may also become infected with the larval stage through the ingestion of eggs shed in faeces of infected humans. The most severe form of the infection by the larval stage in humans is neurocysticercosis which causes neurological disorders including seizures (epilepsy) and sometimes death. Cysticercosis, although normally clinically inapparent in pigs, is associated with significant economic losses due to carcass condemnation and decreased value of pigs, and causes a major disease burden in humans.

Rationale: The United States recommends this sentence be modified as indicated. As currently written, it is circular “Infection ... is a ... infection ...”, and does not add anything that is not already stated in the next few sentences. In addition, *T. solium* is not a parasite of only pigs, but cysticerci have occasionally been found in dogs, cats, sheep, deer, camels and monkeys (Acha and Szyfres, 3rd Ed. Pg. 166).

In humans, taeniosis occurs following ingestion of pig *meat* containing viable cysticerci and can be prevented by avoiding consumption of raw or undercooked contaminated pig *meat*. In humans, cysticercosis occurs following ingestion of *T. solium* eggs and can be prevented by avoiding exposure to *T. solium* eggs through detection and treatment of human tapeworm carriers, community health education, appropriate sanitation, personal hygiene, and good food hygiene. Collaboration between the *Veterinary Authority* and the public health authority is essential in preventing and controlling *T. solium* transmission.

In pigs, cysticercosis occurs by ingestion of *T. solium* eggs from faeces, or environments contaminated with faeces of humans harbouring adult *T. solium*.

The aim of this chapter is to reduce the risk of *infection* with *T. solium* of humans and pigs and to minimise the international spread of *T. solium*. The chapter provides recommendations for prevention, control, and *surveillance* of infection with *T. solium* in pigs.

This chapter should be read in conjunction with the Codex Alimentarius Code of Hygienic Practice for Meat (CAC/RCP 58-2005).

When authorising the import or transit of the *commodities* covered in this chapter, with the exception of those listed in Article 15.X.2. *Veterinary Authorities* should apply the recommendations in this chapter.

Standards for diagnostic tests are described in the *Terrestrial Manual*.

Article 15.X.2.

Safe commodities

When authorising import or transit of the following *commodities* of pigs, *Veterinary Authorities* should not require any *T. solium* related conditions regardless of the status of the animal population of the *exporting country*:

- 1) processed fat;
- 2) casings;
- 3) semi-processed skins which have been submitted to the usual chemical and mechanical processes in use in the tanning industry;
- 4) bristles, hooves and bones;
- 5) embryos and semen.

Article 15.X.3.

Measures to prevent and control infection with *T. solium*

The *Veterinary Authority* and other *Competent Authorities* should carry out community awareness and education programmes on the risk factors associated with transmission of *T. solium* emphasising the role of pigs and humans.

The *Veterinary Authority* or other *Competent Authorities* should promote the following measures:

1. Prevention of infection in pigs

Transmission of *T. solium* eggs from humans to pigs can be avoided by:

- a) preventing the exposure of pigs to environments contaminated with human faeces;
- b) preventing the deliberate use of human faeces as pig feed or the use of pigs as a means of human faeces disposal;
- c) preventing the use of untreated sewage effluent to irrigate or fertilise land to be used by pigs for forage and food crops;
- d) providing adequate toilet and sanitation facilities for people in pig rearing *establishments*

2. Control of infection in pigs

- a) The *Veterinary Authority* should ensure that all slaughtered pigs are subjected to post-mortem *meat* inspection in accordance with Chapter 6.2., and with reference to Chapter 2.9.5. of the *Terrestrial Manual*.
- b) When cysticerci are detected during post-mortem *meat* inspection:
 - i) if 20 or more cysticerci are detected in a carcass of a pig in multiple locations such that it is not feasible to trim out, that carcass and its viscera, as well as all pigs from the same *establishment* of origin should be disposed of in accordance with Article 4.12.6.;
 - ii) if fewer than 20 one or only a few cysticerci are detected in a carcass of a pig, the meat from that carcass and from all pigs from the same *establishment* of origin should be treated in accordance with Article 15.X.6. or disposed of in accordance with Article 4.12.6.;

Rationale: There is little scientific basis for treating carcasses differently if they are found to have less than 20 cysticerci vs. more than 20 cysticerci. The cut-off is also impractical and would lead to inconsistent application. Therefore, the United States suggests that carcasses with extensive infestations be condemned while those with few detections be trimmed and then treated (i.e. thermal processing).

- iii) an investigation should be carried out by the *Veterinary Authority* and the public health authority to identify the possible source of the *infection* in order to target an intervention-;
- iv) post-mortem examination of pigs ~~for~~ at *slaughter* from known infected *establishments* should be intensified until sufficient evidence has been obtained indicating that the *infection* has been eliminated from the *establishment*.

An optimal control programme should include detection and treatment of human tapeworm carriers.

Article 15.X.4.

Surveillance for infection with *T. solium* in pigs

Communication procedures on the occurrence of *T. solium* should be established between the *Veterinary Authority* and public health authorities.

The *Veterinary Authority* should use information from public health authorities and other sources on human cases of taeniosis or cysticercosis in the initial design and any subsequent modification of *surveillance* programmes.

Surveillance can be conducted by:

- 1) *meat* inspection at *slaughterhouses/abattoirs*;
- 2) tongue inspection of live pigs at markets provided that the methods used do not cause injury and avoid unnecessary suffering;
- 3) other diagnostic tests on live pigs.

The data collected should be used for investigations and for the design or amendment of control programmes as described in Article 15.X.3.

Animal identification and *animal traceability* systems should be implemented in accordance with the provisions of Chapters 4.1. and 4.2.

Article 15.X.5.

Recommendations for the importation of meat and meat products of pigs

Veterinary Authorities of *importing countries* should require the presentation of an *international veterinary certificate* attesting that the entire consignment of *meat* or *meat products*:

- 1) has been produced in accordance with the Codex Code of Hygienic Practice for Meat (CAC/RCP 58-2005);

AND

- 2) comes from pigs which have been slaughtered in an approved *slaughterhouse/abattoir*;

AND

- 3) either
 - a) comes from pigs born and raised in a country, *zone* or *compartment* demonstrated to be free from *T. solium* in accordance with Article 1.4.6.;

or

- b) comes from pigs which have been subjected to post-mortem inspections for *T. solium* cysticerci with favourable results;

or

- c) has been processed to ensure the inactivation of the *T. solium* cysticerci in accordance with one of the procedures referred to in Article 15.X.6.

Article 15.X.6.

Procedures for the inactivation of *T. solium* cysticerci in meat of pigs

For the inactivation of *T. solium* cysticerci in *meat* of pigs, one of the following procedures should be used:

- 1) heat treatment to a core temperature of at least ~~80~~ 60°C; or
- 2) freezing to minus 10°C or less for at least ten days or any time and temperature equivalent.

Rationale: The 60°C minimum has held the test of time and shown to be a minimum adequate temperature. There is no scientific reason to change this standard.

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